

22. A nucleic acid sequence encoding a polypeptide having at least 30 amino acids, wherein the sequence comprises a linear concatamer of at least two non-identical DNA sequences, wherein the non-identical DNA sequences each encode the same amino acid sequence of a polypeptide, and wherein the concatamer comprises codes for an oligomer of the polypeptide in a continuous reading frame.

23. A nucleic acid sequence encoding a polypeptide having at least 30 amino acids, wherein the sequence comprises a linear concatamer of at least two non-identical DNA sequences, wherein the non-identical DNA sequences each encode the same amino acid sequence of a polypeptide that is a ligand of complement receptor type 2 (CR2, CD21), and wherein the concatamer comprises codes for an oligomer of the polypeptide in a continuous reading frame.

24. A nucleic acid sequence according to claim 22, wherein a single invariant cysteine codon has been added to one DNA sequence to encode a polypeptide derivative with a unique unpaired cysteine.

25. A nucleic acid sequence according to claim 24, wherein the added cysteine codon is located at the 3' end of the sequence to encode a cysteine at the C-terminus of the corresponding polypeptide.

26. A nucleic acid sequence according to claim 22, wherein the concatamer is fused to one or more sequences encoding one or more antigens.

27. A nucleic acid sequence according to claim 22, wherein the concatamer is fused to one or more sequences encoding one or more antigens and a single cysteine codon has been added to or inserted in-frame in only one antigen coding sequence.

28. A nucleic acid sequence according to claim 26, wherein the concatamer is fused to one sequence coding one antigen.

29. A nucleic acid sequence according to claim 22, wherein the encoded polypeptide ligand is the complement C3 fragment C3d, or a sub-fragment thereof.

30. An expression vector comprising a concatamer nucleic acid sequence according to claim 22 and regulatory or other sequences for expression of any oligomeric polypeptide encoded thereby.

31. A host cell comprising an expression vector according to claim 30.

32. A method of making a concatamerised polypeptide, the method comprising expressing a concatamer according to claim 22 in a host cell; and isolating the expressed product.

33. A method of making a concatamerised polypeptide, the method comprising expressing a concatamer according to claim 24;

isolating an expressed polypeptide having a unique unpaired cysteine and at least one antigen, homo- or hetero- dimerising the isolated polypeptide through formation of an intermolecular disulphide bond; and

isolating the dimerised polypeptide.

34. A method of making a concatamerised polypeptide, the method comprising expressing a concatamer according to claim 24;

isolating an expressed polypeptide having a unique unpaired cysteine and at least one antigen;

conjugating the unique cysteine residue in the isolated polypeptide to a chemical linker group comprising at least two thiol-reactive functions, and isolating the conjugated polypeptide.

35. A method of making a chemically reactive concatamerised polypeptide, the method comprising forming a DNA construct, the construct being formed by fusing a concatamer according to claim 22 in-frame firstly to a DNA sequence encoding a self-splicing intein polypeptide and secondly to a DNA sequence encoding a protein domain with a ligand specificity useful for affinity chromatography;

expressing the DNA construct; and

isolating the expressed fusion polypeptide by chromatography on an immobilised ligand which has specificity for said protein domain.

36. A method for making a chemically reactive adjuvant concatamerised polypeptide according to the method of claim 35, wherein the concatamer encodes repeated polypeptide units which are C3d or another ligand of CR2 (CD21), and wherein the concatamer is fused to a bacterial intein sequence and fused to a chitin binding domain, and wherein the expressed fusion polypeptide is isolated by affinity chromatography on immobilised chitin.

37. A method of making a concatamerised polypeptide, the method comprising coupling the isolated polypeptide thiol ester made by the method according to claim 35 to one or more antigen proteins.

38. A method according to claim 37, further comprising coupling the polypeptide to one antigen protein.

39. A method of making a concatamerised polypeptide, the method comprising expressing a concatamer according to claim 24;
isolating an expressed polypeptide having a unique cysteine residue; and
conjugating the unique cysteine residue in the isolated polypeptide through a chemical linkage to an antigen molecule comprising one or more thiol-reactive functions.

40. A method of making an antigen derivative, the method comprising expressing a concatamer according to 24 with a unique unpaired cysteine; separately expressing or preparing an antigen derivative with one or more unpaired cysteines; linking the two entities through an intermolecular disulphide bond; and isolating the product.

41. A pharmaceutical composition comprising concatamer according to claim 22 and a physiologically acceptable excipient or carrier.

42. A pharmaceutical composition comprising a vector according to claim 30 and a physiologically acceptable excipient or carrier.

43. A method of inducing an immune response to an antigen in the human or animal, the method comprising administering a concatamer according to claim 22.

44. A method of inducing an immune response comprising administering a pharmaceutical composition according to claim 42.